

**PATENT**

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COMPUTER PROGRAM AND METHOD FOR DETERMINING THE ECONOMIC  
IMPACT OF LONG-TERM CARE

Background of the Invention

(1) Field of the Invention

This invention pertains to the field of long-term health care insurance. More particularly, this invention  
5 pertains to a computer program and method for use aiding persons in the complex societal and individual decision process of assessing risk and risk mitigation options regarding potential long-term custodial care needs required in a personal residence or care facility due to  
10 cognitive impairment or inability to independently perform significant activities of daily living as a result of accidents or chronic health related conditions that may be required by one or more family members.

(2) Description of the Related Art

Various methods and software applications have been developed for use in the estate planing, financial advising, and insurance industries for the purpose of forecasting potential economic risks. Software developed for insurance companies that offer long-term health care insurance typically focus on calculating one or more of insurance benefits, potential growth of benefit dollars depending upon selectable inflation options, and insurance premiums. Additionally, software programs are available that compare the benefits offered by various insurance plans, which in some cases automatically determine the lowest premium based on specific criteria. Furthermore, programs exist that are configured to project future cost of care based on program parameters and user input.

However, it is desirable to improve the ability of persons such as advisors, insurance brokers, estate planers, and potential health care recipients to quickly and effectively observe the magnitude of risks associated with long-term health care under varying scenarios. Furthermore, it is desirable to provide a comprehensive, coordinated software application capable of generating analytic reports driven by specific client input related to the personal goals and objectives of the client in a manner that allows rapid risk assessment of the potential economic impact of long-term care on personal assets.

Summary of the Invention

The present invention enables professional advisors, as well as individuals, to improve their understanding of the risks associated with long-term health care in effort to make informed decisions regarding long-term care

insurance. By utilizing factors not previously considered to generate hypothetical economic impacts on personal assets under various scenarios, the present invention provides a powerful tool for obtaining a more accurate prediction of potential economic impacts of long-term care insurance decisions.

One aspect of the preferred embodiment of the present invention is the consideration of tax consequences and other costs such as penalties and transactional fees associated with the liquidation and sale of personal assets to pay long-term care costs (hereinafter referred to generally as tax consequences). Due to the large expenses associated with long-term care, it is often necessary to liquidate personal assets. The preferred embodiment takes the tax consequences into account when calculating potential economic impacts of long-term care costs by upwardly adjusting the value of personal assets required to be sold to pay such long-term costs. Thus the projected economic impact is made more accurate than it would otherwise be. For a fair assessment of the benefits of a given insurance plan, the preferred embodiment also assumes that insurance premiums are paid from the sale of such assets and, therefore, also includes calculations to reflect tax consequences of selling personal assets to pay the insurance premiums.

Another aspect of the preferred embodiment lies in its ability to simultaneously generate both an insured hypothetical economic impact and an uninsured hypothetical economic impact on personal assets for any given hypothetical fact scenario. This aspect of the preferred embodiment allows users to compare the net differences between being insured versus uninsured under any given fact scenario and to weigh risks accordingly.

By changing the hypothetical fact scenario, this aspect of the preferred embodiment also allows users to quickly balance the benefits provided by a given insurance plan with the costs of making insurance premium payments.

5 Yet another aspect of the preferred embodiment of the invention is that the economic impact is determined as a function of time. This aspect of the preferred embodiment allows users to quickly understand how the passage of time influences the hypothetical economic  
10 impact of long-term care costs on personal assets. Additionally, the determination of the economic impact of long-term care costs in the preferred embodiment includes calculations of unrealized investment opportunity that presumably would have been realized from assets  
15 hypothetically sold to pay long-term care costs and further allows determination of the economic impact at a point in time beyond the time of which care is presumed to be given. Thus, by determining the economic impact as a function of time, the preferred embodiment allows users  
20 to appreciate the significance of the unrealized investment opportunity and the impact thereof on such persons as a surviving spouse of the person presumed to have received the long-term care.

25 While the principle advantages and features of the present invention have been described above, a more complete and thorough understanding of the invention may be attained by referring to the figures and the detailed description of the preferred embodiment, which follow.

### 30 Brief Description of the Figures

Figure 1 is a flow chart of the procedure of data entry and use of the preferred embodiment of the invention.

Figure 2 shows the data entry window of the preferred embodiment of the invention.

Figure 3 is a line-chart generated by the preferred embodiment showing both insured and uninsured economic impacts of long-term care costs as a function of time based on a hypothetical fact scenario.

Figure 4 is a bar-chart generated by the preferred embodiment showing the uninsured economic impact of long-term care costs, the total cost of insurance, and the total impact of insurance benefits as a function of time based on the fact scenario.

Figure 5 is a summary report of the economic impact generated by the preferred embodiment for the fact scenario.

Figure 6 is a detailed report of the uninsured economic impact of the long-term care cost generated by the preferred embodiment for the fact scenario.

Figure 7 is a detailed report of the insured economic impact of the long-term care costs generated by the preferred embodiment for the fact scenario.

#### Detailed Description of the Preferred Embodiment

The preferred embodiment of the invention comprises the use of a computer program written in VISUAL BASIC®, the source code of which is provided as Appendix-A. In general, the preferred embodiment is configured to accept input of a fact scenario comprising client variables, care cost variables, insurance variables, and investment and tax variables. From this fact scenario, the preferred embodiment calculates an insured and uninsured economic impact on personal assets based on the data entered and outputs this information both graphically and in report form. The basic flow structure of the

preferred embodiment is shown in the block-diagram of Figure 1. The preferred embodiment is also configured to allow the rapid recalculation of both an insured and uninsured economic impact by allowing the user to return  
5 to the data entry phase of the program after calculations and reports have been made and to modify one or more of the fact scenario variables without re-entering any of the variables intended to remain unchanged.

To facilitate data entry, the preferred embodiment  
10 is configured to allow a user to enter all desired variables from a single formatted data entry window as shown in Figure 2. The data entry window of the preferred embodiment utilizes default values for many of the data entry fields. Additionally, data entry fields  
15 requiring specific predefined options preferably utilize drop-down menus to facilitate data entry therein.

In addition to data used to generate economic impact predictions, the preferred embodiment also allows entry of variables such as the consultant's name or code  
20 number, client names, client addresses and phone numbers, and client social security numbers. While these variables are not used for economic impact predictions, they facilitate the storage and retrieval of client scenarios.

25 The variables shown in the data entry window are also preferably arranged in organized groupings. As shown in Figure 2, the data entry window of the preferred embodiment has a plurality of client data groupings 20, 22 for entry of general information regarding a person  
30 for which the economic impact prediction is sought, and for his or her spouse. In addition to the client data groupings 20, 22, the data entry window has a care data

grouping 24, an insurance data grouping 26, and a tax and investment data grouping 28.

Of the information entered in each of the client data groupings 20, 22, a health entry field and a birth date entry field provide information used by the preferred embodiment to compute the annual insurance premium figures shown in the insurance data grouping 26 as described below. The value of the health entry field is preferably selected from a drop-down menu containing various risk or status scales commonly used and known in the insurance industry to determine insurance premiums and preferably defaults to a "preferred" risk or status. Likewise, the value entered in the birth date entry field is also used to calculate the insurance premiums which are often dependent upon client age. The remainder of the data entry fields of the client data groupings 20, 22 facilitate the storage and retrieval of client scenarios as mentioned above.

The care data grouping 24 contains data entry fields used to simulate and alter a future hypothetical scenario of long-term health care expenses that will be incurred due to a hypothetical extended period of paid personal care required in a personal residence or care facility due to cognitive impairment or inability to independently perform significant activities of daily living as a result of accidents or chronic health related conditions. Included in the care data grouping 24 are entry fields for the hypothetical duration of time in which care will be needed, the duration of time before the care will be needed, which of the persons identified in the client data groupings is presumed will need the care, the duration of the insurance plan, the current periodic cost of the care, and a periodic rate of inflation of the cost

of the care. With the exception of value of the current periodic cost of the care data field, the values of the data fields of the care data grouping 24 are predictions or forecasts of future events. The value of the current  
5 periodic cost of the care data field represents the present-day costs of health care and can be adjusted to represent various degrees of hypothetical long-term care needs and/or to adjust for such things as region-to-region variations in costs of long-term care.

10 The insurance data grouping 26 contains data fields used to calculate costs and benefits of insuring one or more of the clients against long-term health care expenses. The fields of the insurance data grouping 26 include a duration of time of deduction entry field, a  
15 periodic current benefit receivable entry field, a duration of time in which benefits are receivable entry field, a method of determining inflation of benefits receivable entry field, and data fields for a periodic insurance premium for each of the persons identified in  
20 the client data groupings 20, 22. Although the values of these data fields are preferably obtained from specific insurance plans, the preferred embodiment allows alteration of the value of each of these fields independently. The duration of time of deduction entry  
25 field, duration of time in which benefits are receivable entry field, and the method of determining inflation of benefits receivable entry field preferably utilize drop-down menus to facilitate the data entry therein. The entry in the inflation of benefits data field is  
30 preferably either simple, compound, or none. The values of each of the periodic insurance premium data fields preferably automatically default to values determined from preprogrammed premium base rates dependent upon the



values of the health entry field and birth date entry field of the client data groupings 20, 22 and the remaining fields of the insurance data grouping 26. These preprogrammed premium base rates are well known to those skilled in the insurance industry and can be customized for specific insurance plans as needed. However, as mentioned above, the preferred embodiment allows the automatic default value of each of the periodic insurance premium data fields to be overridden if so desired.

The tax and investment data grouping 28 includes a tax rate entry field and a periodic rate of return on investments entry field. The tax rate entry field is for the entry of a projection of a percent rate of loss that would be incurred on the sale of personal assets due to capital gains or other projected expenses of asset liquidation. The periodic rate of return on investments entry field is for the entry of a projected periodic appreciation rate of personal assets.

The preferred embodiment calculates the economic impact on the long-term care costs only after the data has been entered. In other words, calculations of the economic impact are not performed automatically as the value in each data field is changed. This eliminates unnecessary calculations from being made during the data entry phase of the application. However, from the data entry window, the user can toggle or switch to an output mode or report mode. When this is done, calculations are automatically performed on the data contained in the entry window and the user need not manually instruct the program to perform such calculations.

As mentioned above, the software of the preferred embodiment calculates both an insured and uninsured

economic impact for any given scenario of data in the data entry window. Any given economic impact is preferably calculated as a monetary loss of personal assets of an estate. Thus the uninsured economic impact preferably represents the loss of personal assets from an estate assuming that all long-term care costs are paid from estate assets and that no payments of insurance premiums are made. Likewise, the insured economic impact preferably represents the loss of personal assets from an estate assuming that insurance benefits offset at least a portion of the long-term care costs, all remaining long-term care costs are paid from estate assets, and that the insurance premiums are paid from the estate assets.

The software of the preferred embodiment also calculates the insured and uninsured economic impact as a function of time. This is preferably done by calculating the insured and uninsured economic impact on personal assets for the first year of the duration of the insurance plan and then "stepping" through each successive year for the number of years listed in the duration of the insurance plan field of the care data grouping 24, the total impact being the sum of all years.

In the preferred embodiment, both premium payments and the uninsured portion of care costs contribute to the economic impact of long-term care on personal assets. Additionally, it is assumed that both the premium payments and the uninsured portion of care costs are paid from estate assets are therefore subject to tax consequences upon liquidation. Furthermore, the determination of the economic impact of long-term care on personal assets takes into account unrealized investment opportunity in excess of merely determining the value of the portion of assets that must be sold to pay the

premium payments, the uninsured portion of care costs, and the taxes thereon.

5 The calculations of both an uninsured economic impact on personal assets as well as an insured economic impact are essentially identical except that the calculations of the uninsured economic impact assume that the insurance premiums and the insurance benefits are zero. Thus, for purposes of describing the preferred embodiment, the following description includes a  
10 description of how the insurance benefits and premium payments affect the calculation of the economic impact, but it should be understood that the insurance benefits and premium payments are zero when determining the uninsured economic impact. Furthermore, in some  
15 scenarios, the hypothetical care is assumed to occur only after several years into the duration of the plan and/or to terminate prior to ending year of the scenario. In such situations, the care costs are assumed to be zero for those years prior and after the period in which the  
20 care is needed.

For purposes of describing the calculations used by the preferred embodiment to determine the economic impact, it is helpful to first identify and describe certain terms. Additionally, because the preferred  
25 embodiment determines the economic impact by "stepping" through each successive year of the plan, the calculations are described for only a given year and it should be understood that the calculations are repeated for each successive year.

30 The term economic impact refers to the economic impact incurred from the commencement of the scenario up to and including the given calculation year and the term incremental economic impact refers to the change in the

economic impact during the given calculation year. The term prior economic impact refers to the economic impact minus the incremental impact (i.e. the economic impact as calculated the previous year). Additionally, the term  
5 care costs in the description which follows refers to the charge for long-term health services, regardless of whether such charge is covered by insurance.

Several components preferably contribute to the incremental economic impact. One component is the  
10 uninsured care cost. The uninsured care cost is calculated as the amount by which the care costs exceed the insurance benefits. The care costs equal zero during the all years within the duration of time before the care will be needed, as entered in the data entry window.  
15 After this point in time, care costs are calculated as described below for the number of years entered in the data entry window in the duration of time in which care will be needed data field, after which they once again equal zero. Likewise, the insurance benefits equal zero  
20 when the care costs equal zero.

When applicable, the care costs for the given year are determined by converting the current periodic cost of the care to a yearly figure and adjusting the value for the given year by assuming compound annual inflation at  
25 the periodic rate of inflation which was entered in the data entry window.

The insurance benefits for the given year are determined by converting the periodic current benefit receivable to a yearly figure and reducing the value, if  
30 applicable, to account for the duration of time of deduction entered in the data entry window. The reduction of the insurance benefits to account for the deduction period only applies to the first year having

non-zero care costs. The insurance benefits are also adjusted for inflation by either compound or simple inflation, if so selected in the data entry window.

5 Additionally, in general insurance benefits are set equal zero after being calculated for more years than are entered in the data field for the duration of time in which benefits are receivable, unless of course the duration of time in which benefits are receivable is unlimited. However, if there was a deductible period as  
10 described above, benefits are presumed to be received during the next following year, but only for the deduction period.

A second component of the incremental economic impact is the insurance premium payments. The annual  
15 insurance premium payments are determined from values of each of the periodic insurance premium data fields of the data entry window, which in the preferred embodiment are yearly values and therefore need not be adjusted. The insurance premium payments equal the combined values of  
20 each of the periodic insurance premium data fields of the data entry window during the all years within the duration of time before the care will be needed as entered in the data entry window. For those years after, the insurance premium value is equal to zero for the  
25 person presumed to be receiving the care (the person presumed to be receiving the care is designated in the data field the care data grouping 24 of the data entry window). However, payment of the periodic insurance premium is assumed to continue throughout the entire  
30 duration of the insurance plan for all other persons, if any such persons were included in the data entry window. If no such other persons were included in the data entry window, the duration of the insurance plan is typically

A third component that contributes to the incremental economic impact is a presumed tax consequence of the sale of personal assets. In the preferred embodiment, it is presumed that a portion of the personal assets must be liquidated to cover the uninsured care costs and the insurance premium payments. The tax consequences represent losses due to taxes on capital gains and/or other expenses associated with the liquidation of the portion of the personal assets.

In the preferred embodiment, the portion of the estate presumably required to be liquidated is calculated by dividing the sum of the uninsured care costs and the insurance premium payments by one minus the tax rate entered in the tax and investment data grouping 28 of the data entry window. Additionally, the tax rate of the preferred embodiment represents a percentage and thus is first divided by one-hundred before being subtracted from one. In the preferred embodiment, the calculated value of the portion of the estate presumably required to be liquidated inherently includes the tax consequences and it therefore unnecessary to determine the tax consequences alone. However, if desirable, the tax consequences can be calculated as the difference between the portion of the estate presumably required to be liquidated and the sum of the uninsured care costs and the premium payments.

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investment opportunity represents a projected amount of appreciation that would have been realized on the portion of the personal assets liquidated in the given year plus a projected amount of appreciation that would realized  
5 but for the prior economic impact on the personal assets. Hence, the calculation of unrealized investment opportunity for any given year takes the prior economic impact into account and thus continues to increase the economic impact in years without care costs. The  
10 unrealized investment opportunity is preferably determined by multiplying both the value of the portion of the personal assets presumably liquidated in the given year and the prior economic impact by the presumed yearly rate of return on investments. In the preferred  
15 embodiment, the rate of return on investments is entered as a yearly percent gain in data entry window and, as such, is merely divided by one-hundred when calculating the unrealized investment opportunity.

Using the above described components, the  
20 incremental impact for any given year is equal to the portion of the assets that presumably must be liquidated (which itself equals the sum of the uninsured care cost, the insurance premium payments, and the tax consequences), plus the unrealized investment  
25 opportunity, plus the prior economic impact. As mentioned above, calculations are preferably made for both an insured and uninsured economic impact for each year of a scenario.

In the preferred embodiment, the software used to  
30 calculate the above mentioned insured and uninsured economic impacts also automatically generates multiple graphs and reports to facilitate the output of the

calculations. Figures 3 and 4 represent two graphs generated by the software of the preferred embodiment.

Figure 3 is a line-graph of the total estate consumed without insurance and the net cost of care with insurance plotted as a function of time for a given scenario. The total estate consumed without insurance is equivalent to the uninsured economic impact of the personal assets as calculated above. Likewise, the net cost of care with insurance is equal to the insured economic impact as calculated above. Use of this graph or chart allows visual comparison of being insured versus uninsured for the given hypothetical fact scenario.

Figure 4 is a bar-graph showing the total estate consumed without insurance, the total cost of insurance, and the total impact of insurance benefits plotted as a function of time for the scenario used to generate Figure 3. Like in Figure 3, the total estate consumed without insurance in Figure 4 is equivalent to the uninsured economic impact of the personal assets as calculated above. The total cost of insurance is determined from the insurance premium payments, including the aforementioned tax consequences and losses due to unrealized investment opportunities. The total impact of insurance benefits is determined as the sum of the insurance benefits received, the tax consequences from the sale of assets that would have been necessary but for receiving the insurance benefits, and the unrealized investment opportunity that would have been incurred but for receiving the insurance benefits. The purpose of this chart is to show separately the impact of long-term care costs, premium costs, and the total economic value of the of the insurance benefits alone, without having to interpolate these values from other output.



The preferred embodiment also produces reports. Figure 5 is a summary report for the given fact scenario. The summary report lists the basic assumptions entered in the data entry window and indicates both the uninsured and insured economic impact of long-term care cost on personal assets as calculated for the last year of the hypothetical fact scenario.

Figure 6 is a detailed report showing the various components contributing to the calculation of the uninsured economic impact of the long-term care cost on personal assets. The information on this report is broken down for various years of the fact scenario to facilitate the client's understanding of when certain factors become significant. For example, the unrealized investment opportunity or investment opportunity loss as shown gradually becomes a much larger factor of the economic impact than the tax consequences or capital gains taxes as shown.

Figure 7 is a detailed report of the hypothetical insurance benefits and the cost of the insurance premiums. This report allows users to appreciate the total costs of insurance versus the value of the actual benefits received.

The graphs and reports allow for rapid communication of the economic impact calculations for any given fact scenario. By returning to the data entry window, a user can alter or adjust one or more of the entries of the data fields and thereby quickly compare various scenarios. In addition to comparing insured versus uninsured economic impacts under a given fact scenario, the user is able to compare different insurance plans to weigh the benefits of such a plan against their costs.

While the invention has been described in reference to the preferred embodiment, it should be understood the numerous variations could be made without departing for the scope of the invention. As an example, various data entry fields for use in calculating the economic impact or for storing and retrieving scenarios could be added or eliminated in alternative embodiments of the invention. Additionally, the calculation of economic impact, although not preferred, could occur automatically as data is entered in the data entry window. Furthermore, the economic impact could be determined in terms of the value of an estate rather than as the economic loss thereto. Thus, it should be understood that modifications and variations of the invention may be constructed without departing from the scope of the invention defined in the following claims.

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